

Claims

[c1]

1. A cushioning element comprising:

an elastomer material that is substantially non-flowable at room temperature,

a plurality of non-intersecting-columnar elastomeric members, at least some of said non-intersecting-columnar members being free from intersection with walls of other members,

at least some of said non-intersecting-columnar elastomeric members including a quantity of said non-flowable elastomer material,

at least some of said column members exhibiting a characteristic of compression instability in response to being subjected to force exerted on them by a cushioned object.

[c2]

2. A cushioning element as recited in claim 1 wherein said elastomer material comprises an elastomeric copolymer plasticized with a plasticizing agent.

[c3]

3. A cushioning element as recited in claim 2 wherein said plasticizing agent is an oil.

[c4]

4. A cushioning element as recited in claim 1 wherein said cushioning element has shape memory so that when a cushioned object is removed from contact with the cushioning element, the cushioning element has a tendency to return to a shape that approximates the shape of the cushioning element before the cushioning element and the cushioned object came into contact with each other. 5. A cushioning element as recited in claim 1 wherein at least some of said non-intersecting-columnar elastomeric members are of a different cross-sectional shape than others of said non-intersecting-columnar elastomeric members.

[c5]

6. A cushioning element as recited in claim 1 wherein said compression instability is characterized by folding or buckling of said non-intersecting-columnar elastomeric member in response to a compressive force of sufficient magnitude.

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TECHNICAL FIELD

[c6]

7. A cushioning element as recited in claim 1 wherein said compression instability is achieved through a combination of the magnitude and direction of the said force, the geometry of said non-intersecting-columnar elastomeric members and the material properties of said elastomer.

[c7]

8. A cushioning element as recited in claim 1, wherein the cushioning element is designed to serve a function selected from the group consisting of pressure relieving, shear relieving, shock absorbing, vibration attenuating, and energy returning.

[c8]

9. A yieldable cushioning element comprising:

a gelatinous elastomer cushioning media having shape memory and being substantially solid and non-flowable at temperatures below 130 degrees Fahrenheit, said gelatinous elastomer being formed into at least part of a cushioning element that has a top, a bottom, and an outer periphery,

said gelatinous elastomer compressible so that it will deform under the compressive force of a cushioned object, a plurality of non-intersecting-columnar elastomeric members, at least some of said non-intersecting-columnar members being free from intersection with walls of other members,

at least some of said non-intersecting-columnar elastomeric members including a quantity of gelatinous elastomer,

at least some of said non-intersecting-columnar members exhibiting compression instability in response to a compressive force, and the cushioning element being adapted to have a cushioned object placed in contact with said top, and at least one of said non-intersecting-columnar elastomeric members being capable of buckling beneath at least a portion of a cushioned object.

[c9]

10. A device as recited in claim 9 wherein at least some of said non-intersecting-columnar elastomeric members are not in direct physical contact with any other non-intersecting-columnar elastomeric members except through a common base member.

[c10]

11. A device comprising: a cushioning element having a top, a bottom, a center and an outer periphery,

a quantity of gel that is substantially non-flowable at room temperature,

a plurality of non-intersecting-columnar elastomeric members, at least some of said non-intersecting-columnar members being free from shared walls with other members,

each non-intersecting-columnar elastomeric member having an axis,

at least some of said non-intersecting-columnar elastomeric members being formed at least in part from said gel,

at least some of said non-intersecting-columnar elastomeric members having no direct contact with other non-intersecting-columnar elastomeric members when not placed under load, and

at least some of said non-intersecting-columnar elastomeric members exhibiting compression instability when exposed to a compressive force.

[c11]

12. A device as recited in claim 12 wherein said compression instability is achieved through a buckling of said non-intersecting-columnar elastomeric members.

[c12]

13. A device as recited in claim 12 wherein said gel includes an A-B-A triblock copolymer plasticized with a plasticizing agent.

[c13]

14. A device as recited in claim 14 wherein said A-B-A triblock copolymer is selected from the group consisting of SEEPS, SEPS, and SEBS.

[c14]

15. A device as recited in claim 14 wherein said plasticizing agent is an oil.

[c15]

16. A device as recited in claim 14 wherein said copolymer and said plasticizing agent are present in said gel in a range of ratios from 1.0:1.0 to 8.5:1.0 of plasticizing agent to copolymer.

[c16]

17. A device as recited in claim 14 wherein said copolymer and said plasticizing agent are present in said gel in a range of ratios from 1.5:1.0 to 5.5:1.0 of plasticizing agent to copolymer.

18. A cushioning element as recited in claim 2 wherein said elastomeric copolymer is an A-B-A triblock copolymer.

19. A cushioning element as recited in claim 19 wherein said A-B-A triblock copolymer is selected from the group consisting of SEEPS, SEPS, and SEBS.

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